

RHIC

Linear Modulator

K.Vetter
April 13, 1998
Rev. 8

1.0 OVERVIEW

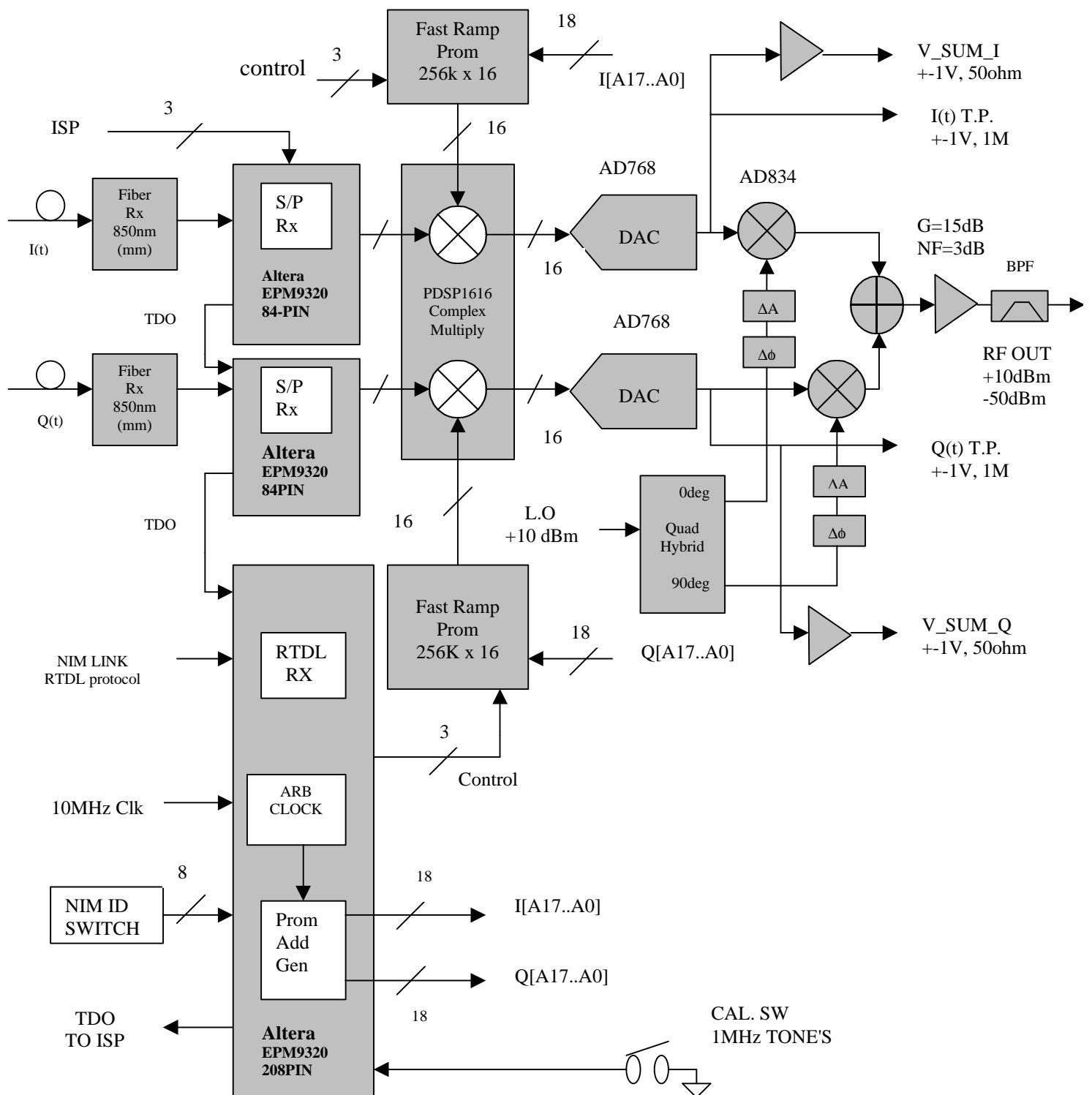
The function of the Linear Modulator is to provide a linear vector modulated RF signal to the HLRF. The primary characteristics are 60dB of linear magnitude range, one degree of phase resolution, and an output of +10dBm (50 ohms). On board PROMS are included to provide high speed modulation functions via remote control. Operation is guaranteed at the two RHIC RF narrowband frequencies of 28MHz and 197MHz.

2.0 SPECIFICATIONS

PARAMATER	DESCRIPTION	SPECIFICATION	COMMENT
Input Power	L.O. input	+10 dBm (10mw, 50 ohm)	maximum
Output Power	Modulated output	+10 dBm (10mw, 50 ohm)	maximum
Frequency	L.O. input	28MHz or 197MHz	nominal
Bandwidth		TBD	
I - data input	In-phase serial data	850nm, multimode	ST connector
Q - data input	Quadrature serial data	850nm, multimode	ST connector
I - data rate	In-phase serial data rate	720 Hz	Manchester
Q - data rate	Quadrature serial data rate	720 Hz	Manchester
Dynamic Range	Modulated output	60 dB	minimum
Noise Figure	SNR(in)/SNR(out)	TBD	
NIM Control	NIM Control Link	Serial Data Link RTDL data format	Waveform select, phase, resolution, and clock rate,
Arbitrary waveform generator (ARB)	On-board look-up tables (4 independent functions)	(nK x 16) to (8k x 16)	Each waveform
ARB data rate	PROM clock frequency	10MHz/N	N is programmable
Chassis	Mechanical package	NIM (single wide)	

TABLE 1

3.0 BLOCK DIAGRAM



4.0 INTERCONNECTIONS

FRONT PANEL

I-data, DS1
Q-data, DS2
NIM data, DS3
I(t) T/P, +-1V
J9, BNC
Q(t) T/P, +-1V
J10, BNC
ISP
J8

LINEAR MODULATOR
(single-wide NIM chassis)

I
Q
L.O.
TRIG
NIM LINK
RF OUTPUT
V_SUM_I
V_SUM_Q
Power

REAR PANEL

J2 (ST, 850nm, mm)
J3 (ST, 850nm, mm)
J4 (SMC, 50 ohm)
J5 (SMC, TTL)
J6 (Twinax, TTL)
J7 (SMC, 50 ohm)
J11 (SMC, +-1V, 50 ohm)
J12 (SMC, +-1V, 50 ohm)
J1 (42 pin) male
AMP 204186-5